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EXAMINER	
DATSKOVSKIY, SERGEY	

ART UNIT	PAPER NUMBER
2121	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/635,274	HORVITZ ET AL.	
	Examiner	Art Unit	
	Sergey Datskovskiy	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 18-50* is/are rejected.

7)☒ Claim(s) *13-17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-50 have been submitted for examination.

2. Claims 1-12 and 18-50 have been rejected.

3. Claims 13-17 have been objected.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 498 and 1110. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 494 in Fig. 4 and 1111 in Fig. 11. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application.

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-12, 18-22 and 24-50 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claimed invention must produce a useful, concrete and tangible result. Claims 1, 29 and 47 disclose a normalization system, while claim 30 discloses a question-answering system. Language of the claims suggests that the system describes a software product. Such software product is not claimed to be integrated with hardware or stored on a computer-readable medium. It refers to an abstract algorithm that does not produce any tangible real-world results. Specifically, predicting accuracy or quality of results and forming queries does not produce any tangible results. Understanding of the knowledge base is just an abstract idea and not a tangible result. Similarly, any references to cost of query are not limited to real-world values such as, for example, discrete dollar values. Claim 24 is directed to a method of normalizing a database. This result of this method is a set of queries, which are not tangible. The steps of forming a query and performing a cost-benefit analysis are directed to abstract ideas because they are not limited to producing real-world results outside of a computer. Abstract ideas (see Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759) or mere

manipulation of abstract ideas (see Schrader, 22 F.3d at 292-93, 30 USPQ2d at 1457-58) are not patentable.

Depended claims 2-12, 18-22, 24-28, 31-46 and 48-50 are rejected under 35 U.S.C. 101 because of their dependency on rejected independent claims and not fixing the problems found in these claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 26 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "...training at least one model to for the query..." is missing a key word between "to" and "for".

Claim Objections

6. Claims 3-5, 7, 11 and 42 are objected to because of the following informalities:

a. Claims 3, 4, 7 and 11 recite the limitation "the utility model". There is insufficient antecedent basis for this limitation in the claims.

b. The phrase "one a local database" in claim 5 is grammatically incorrect.

c. Claim 42 has a comma after a dot at the end.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-8, 11-12, 23-25, 27-38 and 47-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Lesser et al. ("Information Gathering as a Resource Bounded Interpretation Task").

Claim 1

Lesser teaches a normalization system, comprising: an interface component that receives data corresponding to a heterogeneous knowledge base (page 6, paragraph 3, Web Retrieval Interface); and a normalization component (page 5, RESUN Planner) that applies a model that predicts accuracy or quality of results to provide a regularized understanding of the knowledge base (page 5, Modeling Framework).

Claim 2

Lesser teaches the system of claim 1, the interface component processes questions posed by users (page 6, paragraph 3, "...consistent interface to interactive Web-based services, allowing the problem solver to pose queries...").

Claim 3

Lesser teaches the system of claim 1, the utility model dynamically controls extraction of previously unknown or disassociated information from the knowledge base (page 8, lines 14-16).

Claim 4

Lesser teaches the system of claim 1, the utility model controls a number of queries submitted to the knowledge base given decision-theoretic considerations (page 2, Figure 1, paragraph 2, disclosed is an example of using decision criteria such as time, cost and quality to determine which sources of information will be used. Such determination inherently affects the number of queries).

Claim 5

Lesser teaches the system of claim 1, the knowledge base includes at least one a local database, a file, a directory, an electronic encyclopedia, a dictionary, a remote database, and a remote web site (page 6, Web Retrieval Interface, the knowledge base is the World Wide Web).

Claim 6

Lesser teaches the system of claim 1, where the knowledge base is the World Wide Web (page 6, Web Retrieval Interface receives information from the Internet).

Claim 7

Lesser teaches the system of claim 1, the utility model applies a cost-benefit analysis to dynamically control the number and types of attempts made to acquire information or answers from the knowledge base in response to a question or questions (page 2, Figure 1, paragraph 2, controlling the number and types of attempts are disclosed in the given example by determining which information sources should be used to acquire information given the model's requirements for cost, time and quality).

Claim 8

Lesser teaches the system of claim 7, the utility model includes an analysis of the costs of searching for information versus the benefits or value of obtaining more accurate answers to questions (page 2, paragraph 1).

Claim 11

Lesser teaches the system of claim 1, further comprising a preference component that enables users to assess or select various parameters that influence the utility model (page 2, second paragraph, cost and quality constrains are gathered by the planning component. See also page 5, RESUN Planner, "...information gathering goal specification from an external decision maker, which can be a human...").

Claim 12

Lesser teaches the system of claim 11, the preference component processes at least one of a user setting for a cost, a value, and a language preference (page 2, second paragraph, cost and quality constrains are gathered by the planning component).

Claim 23

Lesser teaches a computer readable medium having computer readable instructions stored thereon for implementing the interface component and the normalization component of claim 1 (WWW-based information gathering system disclosed by Lesser is a software product. It is inherent for a software product to be contained on a computer readable medium).

Claim 24

Lesser teaches a method to normalize a database, comprising: automatically forming a set of queries from a question posed by a user (page 5, RESUN Planner, "...planner receives an initial information gathering goal specification from an external decision maker, which can be a human..."); and performing a cost-benefit analysis on the set of queries to generate a query subset (page 5, RESUN Planner, lines 4-6).

Claim 25

Lesser teaches the method of claim 24, further comprising automatically ranking the set of queries in an order of likelihood of providing a suitable answer (page 5, last paragraph, Design-to-Criteria Scheduler orders a set of queries to satisfy quality, cost and duration requirements that determine suitability of an answer).

Claim 27

Lesser teaches the method of claim 24, further comprising submitting the query subset to at least one search engine (page 8, last line through page 9, line 2).

Claim 28

Lesser teaches the method of claim 27, further comprising receiving results from the at least one search engine and automatically composing an answer (page 9, paragraphs 1 and 2).

Claim 29

Lesser teaches a system to facilitate database normalization, comprising: means for formulating a query set from a user question (page 5, RESUN Planner, "...planner receives an initial information gathering goal specification from an external decision maker, which can be a human..."); and means for forming a query subset from the

query set based at least in part on a utility model employed for normalizing the database (page 5, RESUN Planner, lines 4-6).

Claim 30

Lesser teaches a question-answering system, comprising: a rewriting component that receives a user query and automatically formulates a set of queries (page 5, RESUN Planner, "...planner receives an initial information gathering goal specification from an external decision maker, which can be a human..."); and a cost-benefit component to reduce the set of queries based upon an analysis of expected gains in accuracy of an answer in view of associated costs for additional queries (page 5, RESUN Planner, lines 4-6).

Claim 31

Lesser teaches the system of claim 30, further comprising a ranking component to determine an ordering for the set of queries (page 5, last paragraph, Design-to-Criteria Scheduler orders a set of queries to satisfy quality, cost and duration requirements that determine suitability of an answer).

Claim 32

Lesser teaches the system of claim 30, further comprising an answer composer to formulate an answer from the reduced set of queries (page 6, Information Extraction).

Claim 33

Lesser teaches the system of claim 30, further comprising at least one search engine to process the set of queries (page 8, last line through page 9, line 2).

Claim 34

Lesser teaches the system of claim 30, further comprising a component to process full text and/or text summaries of articles returned by a search engine (page 6, Information Extraction).

Claim 35

Lesser teaches the system of claim 30, further comprising a component that learns logical or statistical predictive models that predict an accuracy or quality of answers as a function of nature or number of queries issued to a knowledge base (page 5, RESUN Planner, lines 4-6).

Claim 36

Lesser teaches the system of claim 30, further comprising a component that learns logical or statistical predictive models that predict an age appropriateness of answers as a function of nature or number of queries issued to a knowledge base (page 3, last paragraph, lines 4-6. Age appropriateness is disclosed as a time constraint that

indicates the willingness of a user to wait for an answer, where a longer wait time means an increase in age).

Claim 37

Lesser teaches the system of claim 35, the knowledge base includes at least one search engine (page 8, last line through page 9, line 2).

Claim 38

Lesser teaches the system of claim 35, the models employ Bayesian learning procedures (page 3, last paragraph, lines 4-6; use of prior probability values implies Bayesian learning).

Claim 47

Lesser teaches a normalization system, comprising: an interface component that receives data corresponding to a heterogeneous knowledge base (page 6, paragraph 3, Web Retrieval Interface); and a normalization component (page 5, RESUN Planner) that applies a model that predicts accuracy or quality of results in conjunction with a utility model to provide a regularized understanding of the value of performing different information extraction actions from the knowledge base (page 5, Modeling Framework).

Claim 48

Lesser teaches the system of claim 47, the interface component processes questions posed by users (page 6, paragraph 3, "...consistent interface to interactive Web-based services, allowing the problem solver to pose queries...").

Claim 49

Lesser teaches the system of claim 47, further comprising a dialog component that makes a decision when to engage a user to request a reformulated question or additional information (page 5, RESUN Planner receives an initial information gathering goal from a user, and then formulates a plan that delineates alternative ways to go about gathering the information based on different statistical possibilities of quality, cost and duration. Formulating the plan implies contacting user about possible query reformulation based on choosing an alternative way gathering the information).

Claim 50

Lesser teaches the system of claim 49, the dialog component alerts the user about the cost of receiving a good answer, or recommends that a query be attempted elsewhere (page 5, RESUN Planner receives an initial information gathering goal from a user, and then formulates a plan that delineates alternative ways to go about gathering the information based on different statistical possibilities of quality, cost and duration.

Indicating the cost of query that does not match user's requirements implies advising user to search elsewhere).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 39-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lesser et al. in view of Harabagiu et al. ("Falcon: Boosting Knowledge for Answer Engines").

Claim 39

Lesser teaches the system of claim 30.

Lesser does not expressly teach further comprising a component to analyze at least one feature, the feature including at least one of a conjunctional and a phrasal rewrite.

However, Harabagiu teaches a component to analyze at least one feature, the feature including at least one of a conjunctional and a phrasal rewrite (pages 7-8, morphological, lexical and semantic alterations; see page 8, Figure 10 for an example of a conjunctional rewrite).

Lesser and Harabagiu are analogous art since they are both directed to a question answering system. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to take the rewriting component from Harabagiu (pages 7-8, morphological, lexical and semantic alterations) and include it in the information gathering agent from Lesser. Rephrasing questions would provide an advantage of opening new search spaces (Harabagiu, page 4, left column, second paragraph). Therefore, it would have been obvious to modify Lesser in view of Harabagiu by rephrasing queries used by the information gathering agent.

Claim 40

Lesser teaches the question answering system.

Lesser does not expressly teach the feature includes at least one of a longest phrase, a word length, a number of capital letters, a number of phrases, a number of stop words, a number of words, a percentage of stop words, a number of primary parses, a number of secondary parses, and a measure of grammatical suitability.

However, Harabagiu teaches the feature includes at least one of a longest phrase, a word length, a number of capital letters, a number of phrases (page 3, left column, lines 8-10), a number of stop words, a number of words (page 4, step 6 of the algorithm includes a number of content words), a percentage of stop words, a number of primary parses, a number of secondary parses, and a measure of grammatical suitability (page 6, Semantic Knowledge, first paragraph discloses using statistical parsers for parsing questions and answers. Such parsing implies a number of parses

and is illustrated in page 7, Figures 7 and 8. Grammatical suitability is disclosed on page 8, right column, as a first-order predicate formula for transforming question and answer).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lesser in View of Harabagiu by rephrasing queries used by the information gathering agent using the same motivation as in claim 39 above.

Claim 41

Lesser teaches the question answering system.

Lesser does not expressly teach the system further comprising higher-level features including a distribution of topics associated with results of queries.

However, Harabagiu teaches higher-level features including a distribution of topics associated with results of queries (page 5, The expected answer type).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lesser in View of Harabagiu by rephrasing queries used by the information gathering agent using the same motivation as in claim 39 above.

Claim 42

Lesser teaches the features are identified with a statistical classifier that assigns topics based on text being analyzed (page 8, paragraphs 3 and 4 disclose using degree of belief on extracted text to identify the answer categories).

Claim 43

Lesser teaches the question answering system.

Lesser does not expressly teach further comprising tags that are derived from natural-language parses of initial questions, and text of results or text of snippets returned from the results.

However, Harabagiu teaches further comprising tags that are derived from natural-language parses of initial questions, and text of results or text of snippets returned from the results (page 6, chapter Semantic Knowledge describes parsing text of question and answer (first paragraph), second paragraph discloses tagging tree leaves as skipnodes or non-skipnodes. See also page 7, Figure 7).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lesser in View of Harabagiu by rephrasing queries used by the information gathering agent using the same motivation as in claim 39 above.

Claim 44

Lesser teaches a component to derive higher-level informational goals of a user, as derived from assessing goals directly, or as inferred from an analysis of the user's initial question (page 3, last paragraph, lines 2-4).

Claim 45

Lesser teaches the question answering system.

Lesser does not expressly teach further comprising classes of features including attributes and statistics of attributes of morphological or semantic aspects of an initial (1) question and/or (2) one or more query results.

However, Harabagiu teaches further comprising classes of features including attributes and statistics of attributes of morphological or semantic aspects of an initial (1) question and/or (2) one or more query results (page 6, Semantic Knowledge, questions and answers are parsed by a statistical parser (paragraph 1) which results in a tree representation of their semantics. Paragraph 2 farther discloses the use of attributes of morphological or semantic aspects, when the leaves of the parse tree are being classified as skipnodes or non-skipnodes).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lesser in View of Harabagiu by rephrasing queries used by the information gathering agent using the same motivation as in claim 39 above.

Claim 46

Lesser teaches the question answering system having inferred or assessed informational goals (page 3, last paragraph, lines 2-4).

Lesser does not expressly teach that the classes include at least one of words and phrases, parts of speech, structure of natural language parse, length, topics and distribution of topics.

However, Harabagiu teaches that the classes include at least one of words and phrases, parts of speech, structure of natural language parse, length, topics and

distribution of topics (page 6, Semantic Knowledge, paragraph 1, parse trees, page 7, Figures 7 and 8).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lesser in View of Harabagiu by rephrasing queries used by the information gathering agent using the same motivation as in claim 39 above.

Allowable Subject Matter

Claims 13-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kupiec (US Patent No. 5,519,608) teaches a method for extracting from a text corpus answers to questions stated in natural language by using linguistic analysis and hypothesis generation. Agichtein et al. (US App. No. 2002/0169595) teaches a method for retrieving answers from an information retrieval system. Veale (US App. No. 2002/0188586) teaches a multi-layered semiotic mechanism for answering natural language questions using document retrieval combined with information extraction. Lin et al. (US Patent No. 6,675,159) teaches a concept-based search and retrieval system. Clarke et al. teaches "Exploiting Redundancy in Question Answering". Cooper et al. teaches "A Simple Question Answering System". Zukerman et al. teaches "Using machine learning techniques to interpret WH-questions". Braumandl et al. teaches "ObjectGlobe: Ubiquitous query processing on the Internet".

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sergey Datskovskiy whose telephone number is (571) 272-8188. The examiner can normally be reached on Monday-Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight, can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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